

Meru Center

Quick Start Guide

7.0



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About Meru Center

Meru Center is a unified enterprise network platform that integrates the following:

- Meru developed purpose built applications (such as Network Management, Spectrum Management, Meru Connect (originally a standalone application)).
- Open SDN applications (applications built on top of OpenFlow to enable automation and harvest the network intelligence to provide the optimal user experience and enhance business value) that are Meru developed, partner developed, jointly-developed or community developed
- Third-party Applications

Once set up, the Meru Center will provide a unified dashboard view with all important data from across all applications about your network.

Meru Center can be installed in SA2000 appliance or you can choose to use the power of virtualization by installing a virtual machine running in any of the supported hardware platform. Figure 1 illustrates the high level architecture of Meru Center.

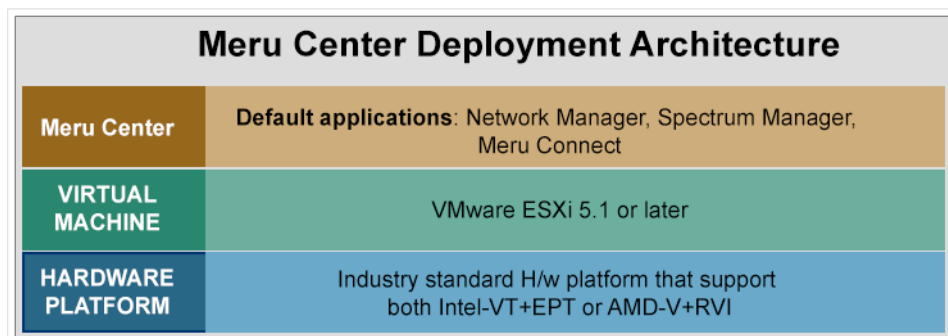


Figure 1 High Level Architecture

Getting Started with Meru Center

Meru Center is distributed as a 64-bit ISO image available for download from the support portal. Download the ISO image and proceed with the installation as described in the preceding section.

Installing in a Virtual Machine

The following procedure is applicable only if you are installing Meru Center in a virtual machine.

Before you Begin

Copy the ISO image to the ESXi server data store and ensure that your deployment environment meets the following system requirements

- Virtual Machine: VMware ESXi 5.1 and later.
- Add ESXi server as a host in vSphere Web Client.
- Hardware platform CPU must support the Intel-VT+EPT or AM-V+RVI Support. Mandatory

Setting up the Meru Center Virtual Image using vSphere Desktop Client

Login in to ESXi5.5 and follow the virtual image set up wizard. Click the Next button after each step to proceed further.

1. Right click the IP address of the target ESXi server and select **New Virtual Machine**.
2. Configuration: Select the typical configuration.
3. Name and Location: Enter a name for the virtual Name.
4. Storage: Displays the available storage.

You will need a minimum of 2GB free space to store the ISO image and minimum of 500 GB free space for the Meru Center virtual machine. This is dependent on the size of deployment. Increase the free space size if you have a large scale deployment.

1. **Guest Operating System:** Select Linux and then select **CentOS 6**.
2. **Network:** Select **1** for **How many NICs you want to connect** and leave the following fields with the respective values:
 - **Network:** VM networks
 - **Adapter:** VMXNET 3
 - **Connect at Power On:** Checked
3. **Create a Disk:** Specify 500 GB for Virtual Disk Size and select Thin Provision. Click **Next** to view the summary.
4. Select **Edit the virtual machine settings before completion** and click the **Finish** button.
5. In the **Virtual Machine Properties** Window, make the following changes:
 - **Memory Size:** Enter 5 GB
 - **CPUs:** Select 5 Virtual Sockets
6. Click the **Finish** button to complete the wizard.

Enable Intel-VT+EPT or AM-V+RVI Support

The following steps are applicable to both ESXi 5.1 and ESXi 5.5 servers.

1. Login in to ESXi server via SSH

2. Open config file `vi /etc/vmware/config`
3. At the end of the config file, add `vhv.enable = "TRUE"` and save the file.

Setting up the Meru Center Virtual Image using vSphere Web Client

After you login, click Home icon and in the right side and then click Hosts and Clusters option in the Home tab. The left pane should display the list of all ESXi servers.

1. Click on your ESXi server and then click **Create a new Virtual Machine** from the right pane. Click **Next** to continue in the New Virtual Machine pop-up box.
2. Enter a name for the virtual machine and click **Next** to continue.
3. Click **Next** to continue in the *Select a compute resource* step. Ensure that the correct ESXi server is selected. Click **Next** to continue in the *Select storage* step.
4. Select **ESXi 5.5 and later or ESXi 5.1 or later for compatibility** and click **Next** to continue.
5. Select **Linux** for guest OS family and select **CentOS 4/5/6 (64-bit)** for GuestOS version and click **Next** to continue.
6. In the Customize hardware step (See Figure 1), do the following:
 - a. In the Virtual Hardware Tab, Expand CPU and Set CPU to 5. See 1 in Figure 2
 - b. Select **Expose Hardware assisted virtualization** in the guest OS checkbox. See 2 in Figure 2
 - c. Select **Hardware CPU and MMU** for CPU/MMU Virtualization. See 3 in Figure 2

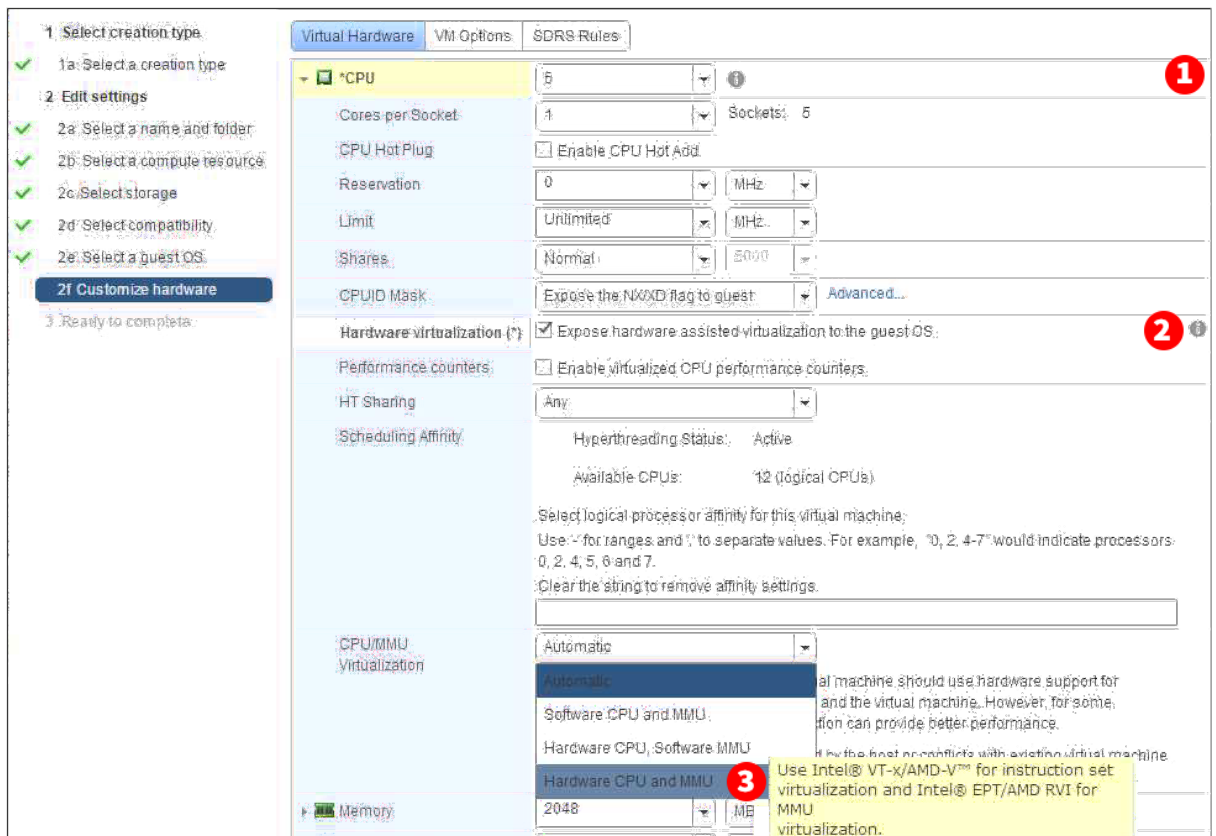


Figure 2

- d. For Memory, Enter **5 GB**. See 4 in Figure 2
- e. Expand New Hard Disk, and Enter **500 GB**.
- f. Select **Thin Provision for Disk Provisioning**. See 5 in Figure 2.

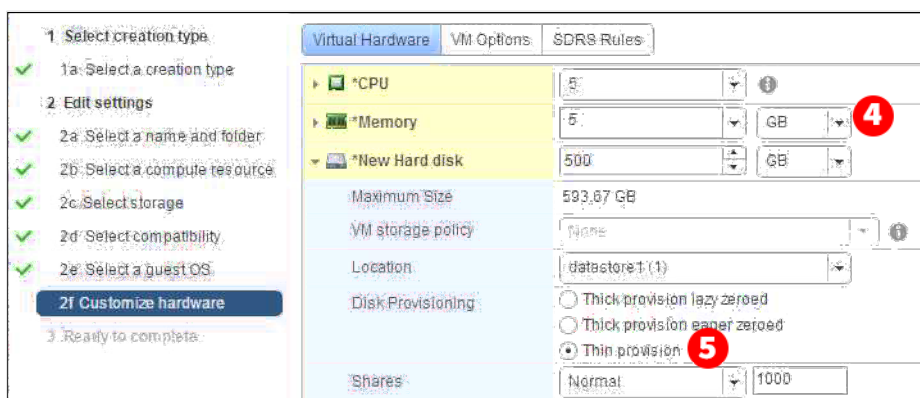


Figure 3

- g. Expand New CD/DVD Drive.
 - Select Datastore ISO file and select the Meru Center ISO file from pop-up window. Click OK to continue.

- Select status **Connect at power on**. See 6 in Figure 3. Click next and view summary of changes. Click **Finish** to complete creating the virtual machine.
- h. Right click the newly created virtual instance and select Power On. After power on, click **Launch Console**.

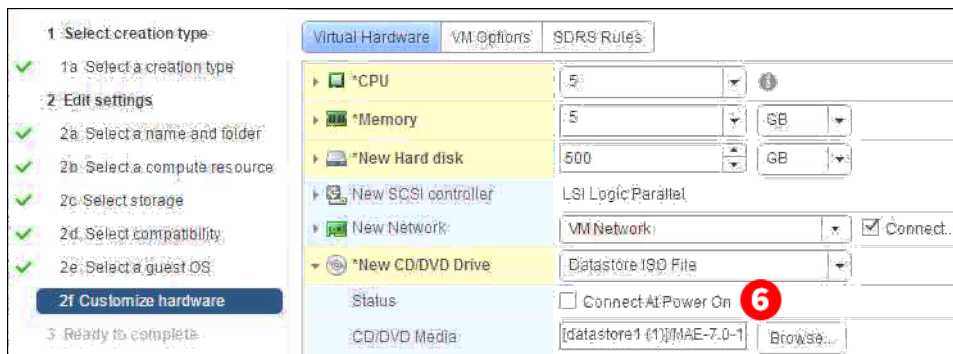


Figure 4

NOTE

You will need to install browser plugins to view the console. This requires browser restart. Enter VMware in the console window. This is usually open in a new browser tab or new window with the instance name as the browser title bar.

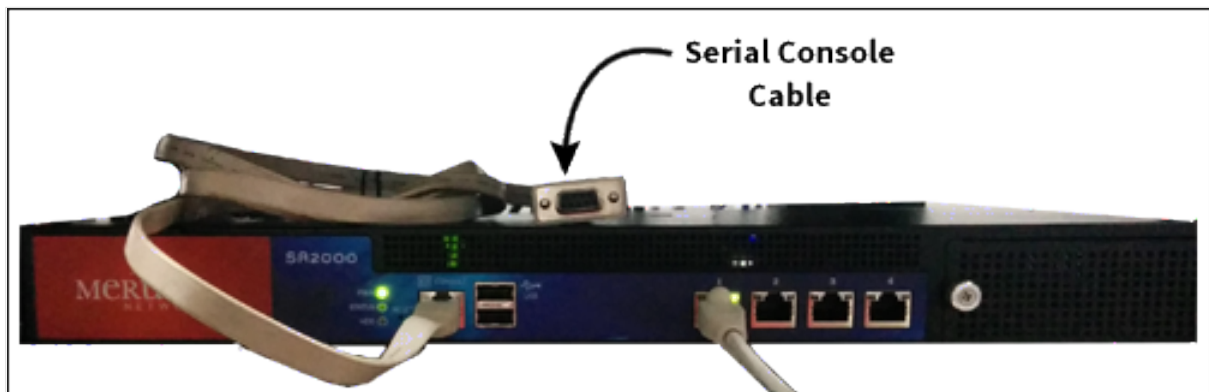
Initializing Meru Center

1. Right click on newly created instance and select **Edit Settings** to open the *Virtual Machine Properties* window.
2. Select **CD/DVD drive 1 (edited)** and do the following:
3. Select **Connect at Power** on check box
4. In the **Datastore ISO File**, select Browse to locate the Meru Center ISO image from your disk.
5. Go to the **Options** tab and select **CPU/MMU Virtualization**. Change this to **Use Intel-VTx/AMD-V for instruction set virtualization and Intel EPT/AMD for MMU virtualization**
6. Click **OK** to complete.
7. Right click on the instance and select **Open Console**.
8. Power on the instance and wait until you get the boot prompt.
9. Type **vmware** and hit the Enter key to continue.

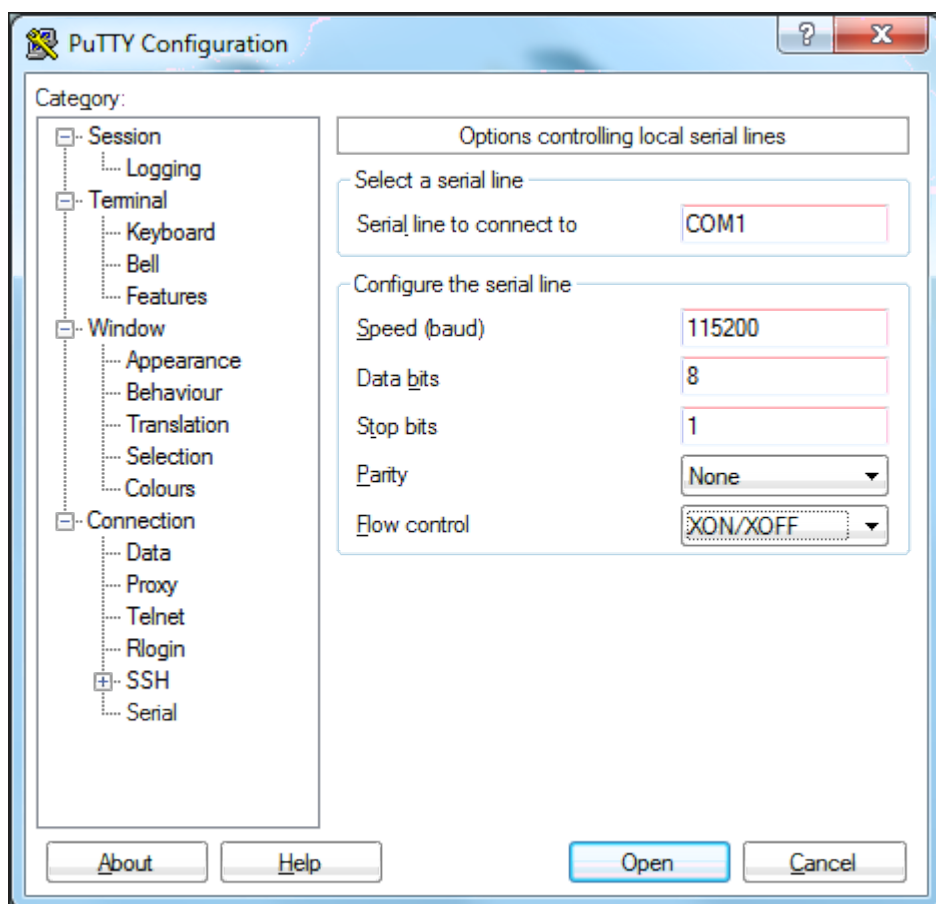
Installing in SA2000

SA2000 is pre-installed with Meru Center. However, if you wish to use your existing SA2000 to install Meru Center, use the following procedure.

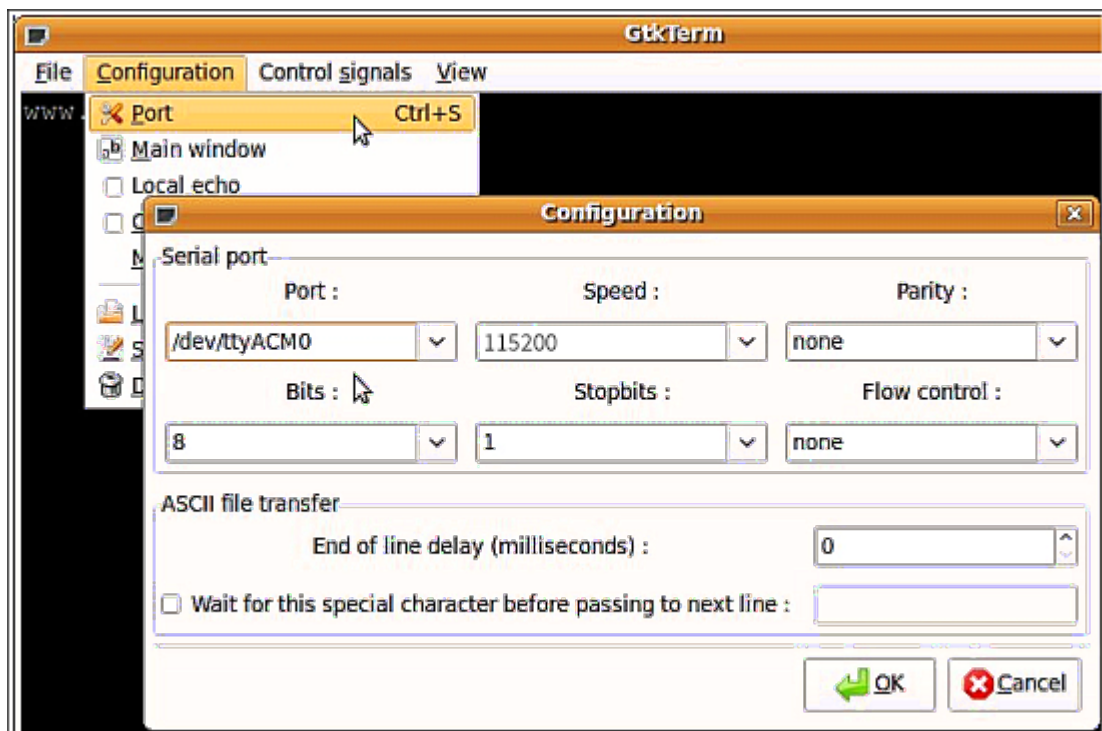
1. Perform the installation using a serial console connection. Attach a console management cable to the serial port on the front of the appliance.



2. From the computer to which the serial cable is attached, run a terminal emulation program with settings set to: 115200 baud, 8 data bits, no parity, 1 stop bit, no flow control.
 - To connect using a Windows computer you will require a terminal application (example: PuTTY)



- To connect using a Linux computer you may use a GTKTerm. Depending on the distribution you use your user may have to be joined to the "dialout" group.



3. Once you have connected to the MERU SA2000 appliance, insert the bootable DVD into an external DVD drive and attach it to the a one of the USB ports on the appliance.
4. Power on the appliance. If the appliance is already started, switch it off and then switch it on again. The appliance should now boot from the CD-ROM drive and the initial install is displayed.
5. In the SA2000 console, enter sa2000 and hit the ENTER key. The SA2000 will download the image from the DVD and install Meru Center into SA2000.

```
-----
Welcome to the Meru Center 7.0 Installation Process
-----

To install on a SA2000 appliance type 'sa2000' then press <ENTER>.
To install on a SA3000 appliance type 'sa3000' then press <ENTER>.
To install on VMware type 'vmware' then press <ENTER>.

***** WARNING *****
This will remove all existing information from the hard disks in the com
or Virtual Machine. Please make sure there is nothing that you need from
hard disk before proceeding. There is no way of retrieving data after th
process has run.
*****

boot: sa2000_
```

Any generic external USB DVD drive can be used. However, the following drives have been tested to work correctly: *Samsung External DVD Writer SE-S084, Lite On DVD ROM eTDU-108, Lenovo 43N3264 External USB DVD Writer.*

Set up Admin Password

It is mandatory to set up the admin password before you proceed with any configuration steps.

```
Meru Center 7.0
localhost login: admin
You are required to change your password immediately (root enforced)
New password: _
```

Set up IP Address

The first step after configuring the admin password is to set up IP address. After a fresh install, the IP address value is blank. Enter **1** to change the IP address of the Meru Center server. You will use then this IP address to access Meru Center via CLI (SSH) and WebUI.

```
Meru Center 7.0.0 Build 129
Network Settings
-----
1) Change eth0 IP Address  []
2) Change eth0 Subnet Mask [255.255.255.0]
3) Change Default Gateway [172.19.46.1]
4) Change DNS Server 1 [172.19.46.221]
5) Change DNS Server 2 []
X) Exit

Option: _
```

```

Meru Center 7.0.0 Build 129

Network Settings
-----

1) Change eth0 IP Address [172.19.46.243]
2) Change eth0 Subnet Mask [255.255.255.0]
3) Change Default Gateway [172.19.46.1]
4) Change DNS Server 1 [172.19.46.221]
5) Change DNS Server 2 []
X) Exit to main menu

Option: 1
Enter new IP Address [172.19.46.243]: 172.19_

```

Enter **A** after making any changes. To change other network parameters, enter the corresponding number.

Access the Meru Center dashboard by entering the Meru Center server IP address ([https://\[Meru Center-ip-address\]](https://[Meru Center-ip-address])) in a browser. Login using the user name and password created while installing Meru Center. By default, the Meru Center dashboard displays the CPU Load and Component status widgets of Meru Connect. The links to default applications are also listed as menu items in the dashboard header. App widgets are displayed only after the respective licences are added.

Click the settings icon (marked in RED box) in the dashboard to view the Meru Center configuration options.



Network Settings

This section provides options to configure the following network parameters:

Hostname

Enter a hostname for the Meru Center server. The hostname and the domain entry together will be used as the FQDN (Fully Qualified Domain Name) for your Meru Center server. Domain: Enter the domain name for your Meru Center server.

IP Address

IP Address: Enter a static IP address for the Meru Center server. By default, this field displays the current IP address of the Meru Center server. Gateway: Enter gateway IP address.

DNS

DNS Server 1: Enter DNS server IP address preference 1 in this field. DNS Server 2: Enter DNS server IP address preference 2 in this field.

Date/Time Settings

The data and time options allows you to configure NTP server or timezone for your Meru Center server. If you chose to use the NTP servers, ensure that you select the Synchronize date and time with NTP option before clicking the SAVE button.

Server Certificates

This page provides options to create CSR files and upload server certificates. Follow the steps below to set up your server certificates.

1. Create a CSR file and use that to generate a certificate from valid server issuing authority. The server issuing authority provides a root certificate and a server certificate.
2. Go to Trusted Certificates options, and upload the root certificate.
3. Then upload the server certificate.

Trusted Certificates

This section provides options to upload root certificates and also lists default root certificates used by Meru Center. See the Server Certificates section to know how you can obtain a root certificate.

IMPORTANT Ensure that you upload the root certificate first before uploading server certificate.

Resources

This section lists hardware status and hardware options (CPU and Memory) for each of the application appliances connected to the Meru Center server. You can also change the memory and CPU settings for each connected application.

Backup Settings

This section provides options to backup data from the connected application installed in Meru Central. By default, the backup will perform the regular backup functions that is available as part of respective apps (Network Manager, Meru Connect). The backup files (per app) are stored in the target location as a tar file.

To restore: Login to respective apps and perform restore operations using procedures defined in the application's user guide.

IMPORTANT

To restore a backup from a stand-alone server (Meru Connect, Meru Network Manager), refer the steps mentioned in the Migration section.

Backup Options	Description
Local	Backup to the local server running Meru Center
FTP/SFTP	Backup to an off-box using FTP or SFTP.
For each of the backup options, enter the following connection parameters:	
Directory	Target location for backup
Username and Password	Authentication credentials to access the target location.
Maximum Number of Server Backups	Specify the number of backup files to be maintained the backup server. Any backup that is done after this limit has reached will erase the oldest backup in the list. The maximum backup limit is 10.

Backup Schedule

Set up a schedule to perform regular backup. You can either set up daily or weekly backup frequency.

- If the backup schedule is set to **Daily**, backup process will begin everyday at 1.a.m.
- If the backup schedule is set to **Weekly**, select the day of the week to start the backup process. The backup process will begin at 1 a.m. every week on the select day.

NOTE

The time to complete the backup process will depend on the size of data

Users

This is the Meru Center user management section. You can add and delete users or modify user details.

- To add a user, click the **Add** button and enter the following:
 - Username
 - First Name
 - Last Name
 - Password: You must confirm password by retyping it in the **Confirm Password** textbox.
- To remove a user, click the **Delete** button for that user.
- To edit user details, click the **Edit** button and make required changes.

Licensing

Meru Center dashboard provides a single window interface to upload and view license status of all your connected apps. Click **Licensing** to view the licensing page. The Licensing page displays the installed licenses for your apps and option to upload licenses for your connected apps.

To upload a license and then browse for a license file and click **Upload** button. The following details about your app's licence are displayed:

- **VM Name** - Name of the app. License ID.
- **Start and Expires** - Displays the license validity period.
- **Users/Count** - For Meru Connect, this displays the total number allowed users. For Network Manager, this displays the total number of allows access points.

System Logs

System logs provide various system level logs or information that is vital for troubleshooting purposes. When you contact Meru Support ensure that you have a copy the system logs file to be sent to the support team.

To start collecting system logs, enable system logs by selecting the **Enable detailed logging** checkbox and then click the **SAVE** button.

When you contact Meru Support, they may ask you for a specific system log or all logs. To download a specific log, for example: Application UI log, click the **Download** button for that log. This will download the log to the default download folder in your desktop. Send this log file to the email address provided by the Meru support representative. To download all logs, click the **Download all logs** button.

Configuring using CLI

To configure Meru Center system settings using CLI, ssh using the IP address configured during the set up process.

NOTE In case of the Meru Center virtual machine, use the IP address of the virtual instance and in case of SA2000 use the IP address of the SA2000 appliance.

Administration Options

The CLI interface provides the following options. To access any of the options, enter the corresponding number: At any given point, enter **X** to return to the previous menu or exit from the Administration menu.

```
Root last login: No previous login

Meru Center 7.0.0 Build 191

Administration Menu
-----

1) About
2) Network Settings
3) Authentication
4) Date & Time Settings
5) Troubleshooting
6) Access shell of installed applications
7) Update Meru Center
8) Shutdown / Reboot
X) Logout

Option: █
```

About

Enter **1** to view Meru Center set up details.


```
Meru Center 7.0.0 Build 129

About
-----

Software: Meru Center 7.0.0 Build 129

Platform: VMware

IP Address: 172.19.46.243

Hostname: localhost.idmqa.com

Serial Number: VMware-56 4d ca dc a1 72 7d 2e-5b f3 de 83 18 c1 7d 7c

System ID: 0912-a5b3-4523-4f85-73b1-f203-973d-0471-9df3-ed58

Disk space: 490G total, 444G free

X) Exit to main menu

Option: _
```

Network Settings

The first step after configuring the admin password is to set up network parameters. After a fresh install, the IP address and the DNS server parameters are displayed without any values. In the main menu enter **2** to view or change network parameters of the Meru Center server.

```
Meru Center 7.0.0 Build 129

Network Settings
-----

1) Change eth0 IP Address []
2) Change eth0 Subnet Mask [255.255.255.0]
3) Change Default Gateway [172.19.46.1]
4) Change DNS Server 1 [172.19.46.221]
5) Change DNS Server 2 []
X) Exit

Option: _
```

Select **1** to change the IP address. You will use then this IP address to access Meru Center via CLI (SSH) and WebUI.

```
Meru Center 7.0.0 Build 129

Network Settings
-----

1) Change eth0 IP Address [172.19.46.243]
2) Change eth0 Subnet Mask [255.255.255.0]
3) Change Default Gateway [172.19.46.1]
4) Change DNS Server 1 [172.19.46.221]
5) Change DNS Server 2 []
X) Exit to main menu

Option: 1
Enter new IP Address [172.19.46.243]: 172.19_
```

Enter **A** after making any changes. To change other network parameters, enter the corresponding number.

Authentication

Select **3** to set up password for Meru Center administrator (admin) access.

Date & Time Settings

Select **4** to view timezone settings.

NOTE You can only view NTP status from CLI. To configure a NTP server, use the administration menu from the Meru Center WebUI..

```
Meru Center 7.0.0 Build 129

Date & Time Settings
-----

Current local time 2014-09-25 10:41:51 [America/Los_Angeles]

X) Exit to main menu

Option: _
```

Troubleshooting

Select **5** to view various troubleshooting and diagnostic tools. This option provides basic troubleshooting support using tools like PING, Traceroute, network parameters.

NOTE Options **5** and **6** are for use by Meru Support only.

```
Meru Center 7.0.0 Build 129

Troubleshooting
-----

1) Ping, DNS Lookup and Traceroute
2) Show Routing Table
3) Show System Processes [Type q to exit]
4) Show Service Status
5) Enter Engineering Mode
6) Clear Admin Password and Power Off
X) Exit to main menu

Option: _
```

Ping, DNS Look and Traceroute

Select **1** in the Troubleshooting menu to use basic network troubleshooting tools like the ping, DNS look and traceroute.

PING

```
Meru Center 7.0.0 Build 129

Pinging www.icann.org - Please be patient
-----

PING www.vip.icann.org (192.0.32.7) 56(84) bytes of data.
64 bytes from www.icann.org (192.0.32.7): icmp_seq=1 ttl=243 time=218 ms
64 bytes from www.icann.org (192.0.32.7): icmp_seq=2 ttl=243 time=209 ms
64 bytes from www.icann.org (192.0.32.7): icmp_seq=3 ttl=243 time=210 ms
64 bytes from www.icann.org (192.0.32.7): icmp_seq=4 ttl=243 time=214 ms
64 bytes from www.icann.org (192.0.32.7): icmp_seq=5 ttl=243 time=215 ms

--- www.vip.icann.org ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 7461ms
rtt min/avg/max/mdev = 209.830/213.724/218.490/3.269 ms

X) Return to previous menu

Option: 1
```

DNS Lookup

```

Meru Center 7.0.0 Build 129

DNS lookup results for www.icann.org
-----

www.icann.org has IP address: 192.0.32.7, FQDN: www.vip.icann.org

Detailed report:

; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.23.rc1.el6_5.1 <<>> +search www.icann.org
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 46213
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.icann.org.                IN      A

;; ANSWER SECTION:
www.icann.org.                21191   IN      CNAME   www.vip.icann.org.
www.vip.icann.org.           22      IN      A       192.0.32.7

;; Query time: 1 msec
;; SERVER: 172.19.46.221#53(172.19.46.221)
;; WHEN: Tue Sep 23 20:42:49 2014
;; MSG SIZE rcvd: 69

X) Return to previous menu

Option: █

```

Traceroute

```

Meru Center 7.0.0 Build 129

Performing traceroute on www.icann.org - Please be patient
-----

traceroute to www.icann.org (192.0.32.7), 30 hops max, 60 byte packets
 1  172.19.46.1 (172.19.46.1)  0.380 ms  0.303 ms  0.251 ms
 2  192.168.253.33 (192.168.253.33)  3.949 ms  3.933 ms  3.878 ms
 3  192.168.254.2 (192.168.254.2)  0.944 ms  1.089 ms  1.220 ms
 4  192.168.254.1 (192.168.254.1)  7.028 ms  7.039 ms  7.031 ms
█

```

Access shell of installed applications

Select **6** for SSH access to all connected applications.

```
Access shell of installed applications
-----

1) Meru Connect
2) Network Manager
X) Exit to main menu

Option: █
```

Select the application to gain it's SSH access.

Migrating to Meru Center

Network Manager

Before you migrate, note the following:

- Ensure that Network Manager version is 6.1-2-28 from which migration is supported for Meru Center Network Manager
- If you have added additional third party certificates to Network Manager you must download those certificates from the existing Network Manager and apply them to mCenter after migration. The mCenter box will have a different system ID to the existing Meru Network Manager box, so any issued Network Manager licences will not be valid and status bar data will not be shown until you have installed reissued licence files using the system ID of the mCenter box.
- Any users that you have defined on Network Manager will be disregarded. You must recreate them on mCenter after migration.

To add new controllers or rediscover existing controllers in Meru Network Manager:.

1. Go To **Administration > System Administration > Server Details** and ensure that the Meru Center IP address is listed as the Public IP Address
2. If you are adding a new controller from an existing or older Network Manager set up, ensure that you delete the controller entries once from that Network Manager WebUI before adding them in Meru Center. Follow the path mentioned below to discover the controller.
3. If you are rediscovering the migrated controllers, ensure that you delete the controller entries once from the Meru Center Network Manager WebUI and follow the below step.

4. To discover controllers in the network, goto **Inventory > Devices > Controllers** and ensure that **Use Server Public IP as Server Connectivity** preference is selected (by default) while specifying other details as required.

Meru Connect

- Before starting ensure source Meru Connect has been upgraded to 14.10 (same as that in mCenter)
- If you want to keep the same server certificate you must download the server certificate, chain and private key from the existing Meru Connect and apply as the server certificate/chain on the mCenter box. You must also set the hostname of mCenter to that of the existing Meru Connect box.
- Clustering and VRRP is not currently supported on Meru Connect under mCenter.
- The list of default third-party certificates is the same for mCenter and Meru Connect. If you have added additional certificates to Meru Connect you must download those certificates from the existing Meru Connect and apply them to mCenter after migration.
- The mCenter box will have a different system ID to the existing Meru Connect box, so any issued Meru Connect licences will not be valid and you will be denied access until you have installed reissued licence files using the system ID of the mCenter box.
- Any admin users that you have defined on Meru Connect will be disregarded. You must recreate them on mCenter after migration.